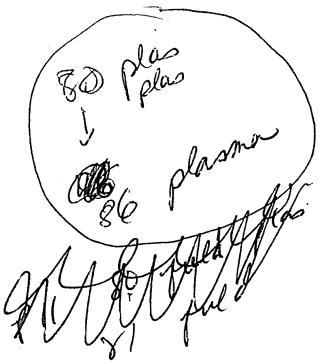
TO: PAM SCHUSTER

FROM: SANDY KIZKMER

RE: COMPOSITE OMNITAPE TAPE FORMAT

12 pages to follow



Z1SDK

DATAMGR.JCL

~~PIOMAG~~ PIOMAG

Omni + p-11 info

Engelwood-chest
$$P238 41

SM-41A

08-27-91

COMPOSITE OMNITAPE

This tape contains hourly IMF data (in GSE and GSM components), interplanetary plasma parameters, and geomagnetic and sunspot indices. The tape is single file, unlabelled, 9 track, created in binary on the IBM 360/75 computer.

DCB=(RECFM=VBS,LRECL=148,BLKSIZE=28420,DEN=3)

WORD	TYPE	MEANING	UNITS/COMMENTS
1	I*4	Flag	=1: IMF and Plasma data, same SC =2: IMF and Plasma data, diff SC =3: No Plasma data =4: No IMF data =5: No IMF or Plasma data
2	I*4	Year	63,64,65.....
3	I*4	Decimal Day	Jan 1 = Day 0
4	I*4	Decimal Hour	(0,1,.....23)
5	I*4	Bartels Rotation Number	
6	I*4	ID for IMF SC	See table
7	I*4	ID for SW Plasma SC	See table
8	I*4	# of fine time scale PTS in IMF Avgs	
9	I*4	# of fine time scale PTS in Plasma Avgs	
10	R*4	Field Magnitude Avg, $\lvert\overline{B}\rvert$	$\frac{1}{N}\sum_i \lvert B\rvert_i$, gammas
11	R*4	Magnitude of Average Field vector, F	$\left[\overline{B}_x^2+\overline{B}_y^2+\overline{B}_z^2\right]^{1/2}$
12	R*4	Lat. Angle of AV. Field VR	Deg (GSE Coords)
13	R*4	Long. Angle of AV. Field VR	Deg (GSE Coords)
14	R*4	$\overline{B}_x$, GSE	Gammas
15	R*4	$\overline{B}_y$, GSE	Gammas

WORD	TYPE	MEANING	UNITS/COMMENTS
16	R*4	$\bar{B}_z$, GSE	Gammas
17	R*4	$\bar{B}_y$, GSM	Gammas
18	R*4	$\bar{B}_z$, GSM	Gammas
19	R*4	$\sigma_{\lvert B \rvert}$	RMS Standard deviation in avg Magnitude (wd. 10), gammas
20	R*4	$\sigma_{\bar{B}}$	RMS Standard deviation in field vector, in gammas (see footnote)
21	R*4	σ_{B_x}	RMS standard deviation in GSE X comp. av, gammas
22	R*4	σ_{B_y}	RMS standard deviation in GSE Y comp. av, gammas
23	R*4	σ_{B_z}	RMS standard deviation in GSE Z comp. av, gammas
24	R*4	Plasma temperature	^oK
25	R*4	Ion density	cm^{-3}
26	R*4	Bulk speed	km/sec
27	R*4	Bulk flow longitude angle	Degrees, GSE coords, >0 for flow from west of sun
28	R*4	Bulk flow latitude angle	Degrees, GSE coords, >0 for flow from south of sun
29	R*4	σ_T	^oK
30	R*4	σ_N	cm^{-3}
31	R*4	σ_V	km/sec
32	R*4	σ_{ϕ_V}	deg
33	R*4	σ_{θ_V}	deg
34	I*4	K_p	from ESRO Tape
35	I*4	C_9	see trans, AGU,
36	I*4	R	Sunspot # 49, 463, 1968

but see note below

The $\sigma_{\bar{B}_\lambda}$ values were not provided with the HEOS IMF data; for such records, words 21-23 contain $\sigma_{|B|}$ (repeat of word 19) and, in degrees, σ_{θ_B} and σ_{ϕ_B}, respectively.

The following spacecraft identifiers have been used

Spacecraft Name	Spacecraft ID
IMP 1 (Expl 18)	18
IMP 3 (Expl 28)	28
IMP 4 (Expl 34)	34
IMP 5 (Expl 41)	41
IMP 6 (Expl 43)	43
IMP 7 (Expl 47)	47
IMP 8 (Expl 50)	50
AIMP 1 (Expl 33)	33
AIMP 2 (Expl 35)	35
HEOS 1 and HEOS 2	1
VELA 3	3
OGO 5	5
Merged LASL VELA speeds (64-3/71)	99
Merged LASL IMP T,N,V (3/71-12/74)	98

Footnote: $\sigma_{\bar{B}}$ is $(\sigma_{\bar{B}_x}^2+\sigma_{\bar{B}_y}^2+\sigma_{\bar{B}_z}^2)^{\frac{1}{2}}$ for IMP records, and is $(\sigma_{|\bar{B}|}^2+|\bar{B}|^2-F^2)^{\frac{1}{2}}$ for HEOS records.

6/16/80

To: Interplanetary Medium Data Book Tape Recipients

From: Joseph H. King JHK

Subject: Sign Conventions for Solar Wind Flow Angles

This memo is to call your attention to an error in the statement of the solar wind flow angle sign conventions on the format statement for the "Composite Omnitape." This is the tape used to produce the Interplanetary Medium Data Book, which itself contains no flow direction information.

Contrary to the format statement, the flow longitude angle (word 27 of the logical record) is positive for flow from west of the sun, and the flow latitude angle (word 28) is positive for flow from south of the sun.

Please append a copy of this note to your format statement, or otherwise note the above correction. I regret any inconvenience this error may have caused you.

corrections have been made on format

SM-418

COMPOSITE OMNITAPE

These tapes contain hourly IMF data (in GSE and GSM components), interplanetary plasma parameters, and geomagnetic and sunspot indices. Missing parameter values are filled with zeroes. The tapes are single file, unlabelled, 9 track available in IBM or VAX binary, ASCII or EBCDIC formats. A discussion of the construction of this data set can be found in the Interplanetary Medium Data Book series.

Format	Data Control
Binary	DCB=(RECFM=FB,LRECL=148,BLKSIZE=28416,DEN=3)
ASCII	DCB=(RECFM=FB,LRECL=182,BLKSIZE=29120,DEN=3)

WORD	ASCII	IBM BINARY	MEANING	UNITS/COMMENTS
1	I1	I*4	FLAG	=1: IMF and Plasma data, same spacecraft =2: IMF and Plasma data, different spacecraft =3: No Plasma data =4: No IMF data =5: No IMF or Plasma data
2	I2	I*4	Year	63,64,65,.....
3	I3	I*4	Decimal Day	January 1 = Day 1=
4	I2	I*4	Decimal Hour	(0,1,.....23)
5	I4	I*4	Bartels Rotation Number	
6	I2	I*4	ID for IMF Spacecraft	See table
7	I2	I*4	ID for SW Plasma spacecraft	See table
8	I4	I*4	# of points in IMF averages	
9	I4	I*4	# of points in Plasma averages	

WORD	ASCII	IBM BINARY	MEANING	UNITS/COMMENTS
10	F6.2	R*4	Field Magnitude Average, $\lvert\tilde{B}\rvert$	$\frac{1}{N}\sum_i \lvert B\rvert_i$, gammas
11	F6.2	R*4	Magnitude of average field vector, F	$[\bar{B}_x^2 + \bar{B}_y^2 + \bar{B}_z^2]^{1/2}$
12	F6.2	R*4	Latitudinal angle (θ_B) of Average field vector	Degrees (GSE coordinates)
13	F6.2	R*4	Longitudinal angle (ϕ_B) of Average field vector	Degrees (GSE coordinates)
14	F6.2	R*4	B_x, GSE	Gammas
15	F6.2	R*4	B_y, GSE	Gammas
16	F6.2	R*4	B_z, GSE	Gammas
17	F6.2	R*4	B_y, GSM	Gammas
18	F6.2	R*4	B_z, GSM	Gammas
19	F6.2	R*4	$\sigma_{\lvert B\rvert}$	RMS Standard deviation in average magnitude (word 10), Gammas
20	F6.2	R*4	$\sigma_{\tilde{B}}$	RMS Standard deviation in field vector, in Gammas**
21	F6.2	R*4	σ_{B_x}	RMS Standard deviation in GSE X component average, Gammas†
22	F6.2	R*4	σ_{B_y}	RMS Standard deviation in GSE Y component average, Gammas†
23	F6.2	R*4	σ_{B_z}	RMS Standard deviation in GSE Z component average, Gammas†

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†The σ_{B_i} values were not provided with HEOS IMF data; for such records, words 21-23 contain $\sigma_{\lvert B\rvert}$ (repeat of word 19) and, in degrees, σ_{θ_B} and σ_{ϕ_B}, respectively.

** $\sigma_{\tilde{B}}$ is $[(\sigma_{B_x})^2 + (\sigma_{B_y})^2 + (\sigma_{B_z})^2]^{1/2}$ for IMP records, and is $[(\sigma_{\lvert B\rvert})^2 + \lvert\tilde{B}\rvert^2 - F^2]^{1/2}$ for HEOS records.

WORD	ASCII	IBM BINARY	MEANING	UNITS/COMMENTS
24	F8.0	R*4	Plasma temperature (T)	°K
25	F5.1	R*4	Ion Density (N)	cm^{-3}
26	F6.1	R*4	Bulk speed (V)	km/sec
27	F6.1	R*4	Bulk flow longitude angle (ϕ_V)	Degrees, GSE coordinates, >0 for flow from west of sun
28	F6.1	R*4	Bulk flow latitude angle (θ_V)	Degrees, GSE coordinates, >0 for flow from south of sun ***see discussion below
29	F8.0	R*4	σ_T	°K
30	F5.1	R*4	σ_N	cm^{-3}
31	F6.1	R*4	σ_V	km/sec
32	F6.1	R*4	σ_{ϕ_V}	degrees
33	F6.1	R*4	σ_{θ_V}	degrees
34§	I2	I*4	K_p	(e.g. 3+ = 33, 6- = 57, 4 = 40)
35§	I1	I*4	C9	Geomagnetic activity index (0 to 9)
36§	I4	I*4	R	Sunspot #
37	I5	I*4	DST Index	

§ From ESRO tape. See Trans. AGU, 49, 463, 1968.

*** Owing to differential gain shifts of the two collector plates of the IMP-8 MIT Faraday cup, an error occurred in the derivation of the solar wind flow latitude direction. This error was not discovered until much erroneous data had been distributed. In December, 1988, flow latitude values from IMP-8 on the NSSDC OMNItape and online version thereof were adjusted for this effect by the subtraction of 2.0 for the years 1973-7, and by the subtraction of 5.0 for all subsequent years.

The following spacecraft identifiers have been used:

Spacecraft Name	Spacecraft ID
IMP 1 (Expl 18)	18
IMP 3 (Expl 28)	28
IMP 4 (Expl 34)	34
IMP 5 (Expl 41)	41
IMP 6 (Expl 43)	43
IMP 7 (Expl 47)	47
IMP 8 (Expl 50)	50
AIMP 1 (Expl 33)	33
AIMP 2 (Expl 35)	35
HEOS 1 and HEOS 2	1
VELA 3	3
OGO 5	5
Merged LANL VELA speeds (7/64-3/71)	99
Merged LANL IMP T,N,V (Including all IMP 8 LANL plasma)	98
ISEE 1	11
ISEE 2	12
ISEE 3	13
PROGNOZ 10	10

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland
20771

NASA

October 9, 1984

Reply to Attn of: 633

Dear Colleague:

Two errors have been found in the NSSDC hourly-averaged interplanetary medium compilation. These errors affect some magnetic field parameters on the "omnitape" and in the Interplanetary Medium Data Book - Supplement 2.

The first error affects values of By(GSE) for May 29 (hour 15), 1980, through August 12 (hour 7), 1980, and values of By(GSM) and Bz(GSM) computed therefrom. The error resulted in very small values of By(GSE). The correct values of By(GSE) can be recovered from the data on the tape with the algorithm:

$$By(GSE) = B * \cos(\theta) * \sin(\phi)$$

where

B = field magnitude (word 11 in omnitape records)

θ = field latitude in radians ($(\pi/180)$ * word 12)

ϕ = field longitude in radians ($(\pi/180)$ * word 13)

Recovery of correct By(GSM) and Bz(GSM) values is not so readily specified, because the rotation angle between solar ecliptic and solar magnetospheric coordinates is a complex function of time of day and season of year. (cf. Russell, Cosmic Electrodynamics, 2, 184 - 196, 1971).

The second error affects values of By(GSM) and Bz(GSM) for the period August 12 (hour 21), 1980, through February 19 (hour 1), 1982. For this period a constant GSE-to-GSM rotation angle of 15.8 deg was inadvertantly applied to correct By(GSE) and Bz(GSE) values to produce incorrect By(GSM) and Bz(GSM) values.

Both of these errors occurred during my preparation of good, experimenter-supplied data for inclusion in the omnitape. Neither of them cause major periods of southward Bz to falsely appear, nor will they cause major periods of real southward Bz to disappear.

It is our intention to quickly produce a corrected version of the omnitape and to distribute it to those who have been sent the omnitape by NSSDC since September, 1981 (when the first error was made). If you have received the omnitape (or Data Book Supplement 2) from us and have further distributed it, please be sure that those receiving incorrect data from you receive a copy of this letter and a copy of the corrected data when available.

After correcting the present omnitape, we will create a new expanded-coverage omnitape containing ISEE-1, ISEE-3, and IMP-8 data not previously available. With this tape we will generate a new Data Book which will totally supersede Interplanetary Medium Data Book Supplement 2. This new tape and book should be available in several months.

I sincerely regret that these errors escaped my detection before distribution of the omnitape and Supplement 2 of the Data Book. I hope that the erroneous data have not led to confusion, wasted effort, or incorrect conclusions in your research. I am very grateful to Dr. Takashi Murayama of Nagoya University for pointing out these errors to me.

Sincerely,

Joseph H. King

JET PROPULSION LABORATORY

January 16, 1979

TO: Distribution

FROM: Joyce Wolf

SUBJECT: TAPE FORMAT: Vector Helium Magnetometer Data Averages

The tapes are 9-track, 1600 bpi, odd parity, written in ASCII format. Each tape contains a single file.

Each file contains an integral number of days of data. There are 50 blocks (physical records) per day. The first block is a header record 240 bytes long. Each of the remaining 49 blocks is 7200 bytes long, and consists of 30 logical records of 240 bytes. The 1440 logical records of blocks 2-49 contain averages for the 1440 minutes of the day. In block 50, the first 24 logical records contain hour averages; the 25th contains day averages, and the last 5 contain blanks.

Each logical record contains 15 quantities in the format (8E15.6, 15X, 7E15.6). The first quantity is the number of milliseconds for which data exists in the period over which the average was taken; the next 14 are the data averages in the coordinate system identified in the text portion of the header record, as follows:

1. $\langle B_x \rangle$
2. $\langle B_y \rangle$
3. $\langle B_z \rangle$
4. $\langle B_x^2 \rangle$
5. $\langle B_x B_y \rangle$
6. $\langle B_x B_z \rangle$
7. $\langle B_y^2 \rangle$
8. $\langle B_y B_z \rangle$
9. $\langle B_z^2 \rangle$
10. $\langle \cos \alpha \rangle = \langle B_x / |B| \rangle$
11. $\langle \cos \beta \rangle = \langle B_y / |B| \rangle$
12. $\langle \cos \gamma \rangle = \langle B_z / |B| \rangle$
13. $\langle |B| \rangle$
14. $\langle |B|^2 \rangle$

JW:ydj

Attachments

ATTACHMENT #1

Structure of Header Record

Variable	Format	Meaning
IYR	3X,I2	Last two digits of year
IDAY	2X,I3	Day of year
ISC	4X,A1	Spacecraft Identifier (F = Pioneer 10, G = Pioneer 11, 3 = ISEE-3)
TRAJ(I),I=1,6	15X,6E15.6	Trajectory parameters May be filled with zeros.
TEXT(I), I=1,30	30A4	Identifying text

For the Pioneer spacecraft, the trajectory parameters have the following meanings:

TRAJ (1) = Distance of spacecraft from sun (km.).

TRAJ (2) = Heliocentric celestial latitude of spacecraft (deg.).

TRAJ (3) = Heliocentric celestial longitude of spacecraft (deg.).

TRAJ (4) = Distance of Earth from sun (km.).

TRAJ (5) = Heliocentric celestial latitude of Earth (deg.).

TRAJ (6) = Heliocentric celestial longitude of Earth (deg.).

For the ISEE-3 spacecraft, the trajectory parameters are as follows:

TRAJ (1) = Geocentric solar ecliptic (GSE) x-coordinate of spacecraft position at start of day's data.

TRAJ (2) = GSE y-coordinate of spacecraft position.

TRAJ (3) = GSE z-coordinate of spacecraft position.

TRAJ (4) = TRAJ (5) = TRAJ (6) = 0.

TO : PAM SCHUSTER

FROM : SANDY KRAMER

RE : PIONEER 11
HOURLY + DAILY
AVERAGES FORMAT

4 pages follow

REQ. AGENT
PAR

RAND NO.

ACQ. AGENT
JHK

PIONEER 11

HOURLY AND DAILY MAGNETIC FIELD AVERAGES

73-019A-01G

This data set consists of one 9-track, 6250 bpi, ASCII magnetic tape created on the MODCOMP IV computer. This tape was created at NSSDC by extracting the hourly and daily averages from the 71 experimenter supplied tapes contained in data set 73-019A-01B (the '01B' data set submitted by Ed Smith, NASA-JPL, contained one minute, hourly and daily averages). This data set was last updated in Dec. 89 using program CRUISE.EXE on the VAX 8650. The D and C numbers and time span are as follows:

D#	C#	FILES	TIME SPAN
D-63110	C-24011	1	04/06/73 - 12/31/86*

* Records on this tape prior to April 6,1973 contain only fill data.

TAPE FORMAT

Each 7440 byte physical block contains a 240 byte header, 24 logical records of 240 bytes containing hour averages, one 240 byte record containing day averages, and 5 blank 240 byte records.

VARIABLE	FORMAT	DESCRIPTION
IYR	3X,I2	Last two digits of year
IDAY	2X,I3	Day of Year
ISC	4X,A1	Spacecraft Identifier (F=Pioneer 10, G=Pioneer 11, 3=ISEE-3)
TRAJ(I), I=1,6	15X,6E15.6	Trajectory Parameters* (May be filled with errors)
TEXT(I), I=1,30	30A4	Identifying text (except for the coordinate system indication, PE or SH (SH is attached) this text is only useful or meaningful to JPL.)

The trajectory parameters (TRAJ) are as follows:

TRAJ (1) = Distance of Spacecraft from sun (km.)

TRAJ (2) = Heliocentric celestial latitude of spacecraft (deg.)

TRAJ (3) = Heliocentric celestial longitude of spacecraft (deg.)

TRAJ (4) = Distance of Earth from Sun (km.)

TRAJ (5) = Helioocentric celestial latitude of Earth (deg.)

TRAJ (6) = Heliocentric celestial longitude of Earth (deg.)

* Trajectory information is available for the first 3 years of data only. (4/6/73 - 3/31/76)

Each logical record contains 15 quantities in the format (8E15.6, 15X, 7E15.6). The first quantity is the number of milliseconds for which data exists in the period over which the average was taken. The next 14 quantities are data averages in the coordinate system identified in the text portion of the header record.

The data parameters are as follows:

1. $\langle B_x \rangle$
2. $\langle B_y \rangle$
3. $\langle B_z \rangle$
4. $\langle B_x^2 \rangle$
5. $\langle B_x B_y \rangle$
6. $\langle B_x B_z \rangle$
7. $\langle B_y^2 \rangle$
8. $\langle B_y B_z \rangle$
9. $\langle B_z^2 \rangle$
10. $\langle \cos a \rangle = \langle B_x / |B| \rangle$
11. $\langle \cos B \rangle = \langle B_y / |B| \rangle$
12. $\langle \cos y \rangle = \langle B_z / |B| \rangle$
13. $\langle |B| \rangle$
14. $\langle |B|^2 \rangle$

PIONEER INERTIAL (PE) COORDINATES